CASE STUDY

INDUSTRY:	CHEMICAL
PROCESS:	PRODUCTION
PRODUCT:	CRUDE BENZENE
APPLICATION:	TRANSFER
SOLUTION:	MULTI-STAGE CENTRIFUGAL PUMP
	IN CLOSE-COUPLED DESIGN WITH MAGNET DRIVE
LOCATION:	GERMANY

THE JOB

A bad combination in many aspects: a vertically installed centrifugal pump that is mechanically sealed (OH6 arrangement), handles a reactive liquid and, last but not least, runs at 9,000 rpm. The high speed was mandatory due to the pump's single-stage design - a critical speed for the mechanical seal and bearings. In consequence, the customer not only had to deal with frequent downtimes, but also with the leakage of the critical liquid that threatens people and the environment.

The objective of this project was to improve availability of the pump, increase process safety, and substantially reduce OPEX, especially those associated with maintenance.

OPERATING DATA

Fluid:	Crude benzene
Flow Rate:	42 m³/h (185 gpm
Temperature:	50 °C (122 °F)
Delivery Head:	460 m (1,509 ft)
Dynamic Viscosity:	0,6 cP
Specific Gravity:	0,866 g/cm ³
NPSH(A):	4,9 m (16 ft)

Klaus Union Magnet Drive When Leakage is not an Option

THE RESULT

Klaus Union supplied a multi-stage centrifugal pump in close-coupled design with magnet drive series SLM GVB 100-050-250/5-19E14 Z. The permanent magnet drive guarantees zero leakage of the medium meeting the safety demands of the customer. As the pump comes with five the pumped liquid. stages providing the required delivery head, the speed The pump was successfully commissioned and has been could be significantly reduced. A frequency converter provides flexibility to handle changing process requirements. in operation without any downtime for maintenance since The space saving close-coupled design not only makes the more than one year. An inspection after 12 months showed bearing frame obsolete resulting in less maintenance, but no wear or damages. Thus, another pump of the custoalso ensures a better fit with the customer's system. mer will be replaced by Klaus Union sealless technology. In addition, a non-metallic containment shell was installed, To even further increase safety, this pump will be equipped with the new Klaus Union hybrid double containment shell. which does not add any heat to the reactive liquid.

HYBRID DOUBLE CONTAINMENT SHELL

Pumping aggressive, explosive and highly toxic liquids requires the highest level of process safety. To protect people and the environment, leakage of the pumped liquid must be avoided - including in the event of a pump failure. For these most critical applications a magnetic drive pump equipped with a monitored, double containment shell still remains the safest solution. To reduce the heat generated by a purely metallic, double containment shell and at the same time to improve the overall efficiency of the pump, Klaus Union has developed and patented a new hybrid double containment shell.

- Reduced heat input into the pumped process liquid
- Increased reliability when pumping liquids close to their boiling point
- Higher efficiency leading to power savings
- Fully compliant with requirements for secondary containment system as defined by API 685, 2nd Edition, § 3.66 (p. 10)
- Available across entire Klaus Union mag-drive pump range

THE SOLUTION

SLM GVB 100-050-250/5-19E14 Z

- SLM: Sealless magnet drive
- ► GVB: Multistage centrifugal pump, close-coupled design
- ▶ 100: Nominal pipe size of suction flange
- Nominal pipe size of discharge flange ▶ 050:
- > 250: Nominal impeller diameter
- ▶ /5: Number of stages
- 19: Magnet drive size
- ► E: Type of magnet
- ▶ 14: Length of magnet drive
- Ceramic containment shell **Z**:





Non-metallic containment shells are made of circonium oxide, which is not electrically conductive. Due to this characteristic there are no eddy current losses impacting the pump performance and no heat is added to

